REMARKS

Claims 15-29 are rejected, under 35 U.S.C. § 102(e), as being anticipated by Turner '474. The Applicant acknowledges and respectfully traverses the raised anticipatory rejection in view of the following remarks.

Turner '474 relates to a "classic" combined rotational speed/rotational speed direction sensor having two Hall effect sensors 24, 26. Each of the Hall effect sensors 24, 26 creates its own independent output signal 40 ,42 which is continually sent to the electronic control unit 30. The electronic control unit 30 uses the output signals 40 and 42 to determine: 1) the rotational speed, and 2) the rotational direction by monitoring a phase shift between the first output signal and the second output signal.

According to Turner '474, the continuous output signals of the Hall effect sensors form two continuous wave forms. These wave forms are phase shifted relative to each other because of their separation from each other about the circumference of a tone ring. As the wave forms pass certain high and low values, their intersection points are either a high threshold or a low signal threshold depending on which value was just passed. As better understood from Fig. 4, when, in sequence, a first signal high threshold, a second high threshold then a second signal high threshold occurs in turn just prior to the first signal high threshold, this sequence is all that is used to determine a reverse in rotational direction, as stated in column 4, lines 53-55. The above sequence of raw analog signals are received by the control unit 30 to determine a rotational velocity and direction signal protocol (pulse signal) in which the reverse high amplitude 58 and reverse low amplitude 60 values are used to indicate reverse rotation of the shaft as both the high and low reverse amplitude is higher than the forward high amplitude 52 and forward low amplitude 54, as stated in column 4 line 55 to column 5, line 2. That is, by measuring the amplitude of square waves produced from the raw analog signals, the rotational direction of the tone ring can be calculated.

Therefore, according to the Turner '474 method, when the second signal high threshold occurs just prior to the first signal high threshold, the control unit always produces a rotational

velocity and direction signal protocol (pulse signal) in which the reverse high amplitude 58 and reverse low amplitude 60 values are both higher than the forward amplitude 52 and 54, then, the direction of rotation is based upon determining the amplitude for either the high or the low amplitudes of the square waves. That is, Turner `474 discloses a method in which the pulse signal (square wave) is always generated before and after determining the direction of rotation, as shown in Fig. 5.

In summation, the Turner `474 method immediately determines a change in the rotational direction of the tone ring when the repeating sequence of the alternating signals from the first and second sensors is interrupted. As stated in the background section of the present invention, on the other hand, this can present a false indication of rotational direction and speed because, as described in the present application and seen in Fig. 3, when the rotation of the signal wheel 2 stops, inconsistent signals may be produced from the two Hall sensors due to random vibration or wear in the signal wheel. These vibrations or inconsistencies in the signal wheel may cause a signal to be read even though there is no rotation of the signal wheel. To overcome this problem, according to the present invention, once a repeating sequence of the alternating signals from the first and second sensors is interrupted, a number of alternating and consecutive signals (e.g., two or more for example) from the first and second sensors must be repeated before a rotational direction and speed of the signal wheel is again determined.

In further distinction and contrast from Turner `474, the presently claimed application relates to use the sensor output signals to recognize both the direction and the speed of the signal wheel. Once a change in rotational direction is recognized, pulse signals are not emitted until the sensor verifies that the signal wheel is in fact rotation in an opposite direction. That is, no further pulse signals are generated until at least two successive and alternating switching signals (I, II) are obtained.

Claim 15 now recites "only generating a pulse signal of the sensor device (1) after the component (2) reverses rotational direction with the rotation movement of the component (2) in the reverse direction being recognized only once a switching signal of one of the first and

second sensor signals (I or II) is consecutively followed by a switching signal of the other first and second sensor signals (II or I) which is then followed by a second switching signal of the one of the first and second sensor signals (I or II) which is then followed by a second switching signal of the other first and second sensor signals (II or I)" while claim 29 now recites "generating only a pulse signal of the sensor device (1) when the component (2) reverses rotational direction and the rotational movement of the component (2) being sensed when a switching signal of one of the first and second sensor signals (I or II) is consecutively followed by a switching signal of the other first and second sensor signals (II or I) which is then followed by a second switching signal of the one of the first and second sensor signals (I or II) which is then followed by a second switching signal of the other first and second sensor signals (II or I)." Claim 30 contains similar limitations. Thus, the Applicant is specifically claiming that when the component (2) reverses rotational direction, a pulse signal of the sensor device (1) is only generated once rotational movement of the component (2) in an opposite direction is recognized. Moreover, the rotational movement of the component (2) is only confirmed once alternating and consecutive switching signals from the first and second sensor signals (I, II) occur at least two or more times. Such specifically recited features of claims 15 and 29, as well as new claim 30, are not believed to be in any way disclosed, taught or suggested by Turner `474 which, at the very least, in no way discloses or teaches the delay in generating a pulse signal. Support for the above entered amendments to the claims is found, for example, in [051] and [052] of the specification.

Using a "classic" sensor unit (for example, as disclosed by Turner `474), a rotary oscillating tone ring will indicate a rotational speed direction change, even though such change really does not exist. According to the present invention, however, when the component is at rest, any rotational oscillations do not lead to the output of a pulse signal and so to the calculation of a component rotation speed as stated in [017] of the specification. This aspect of the presently claimed invention thereby eliminates the problem of the prior art where the desired high sensitivity of the sensor devices, especially when there is vibration of the signal

wheel caused for example at rest by rotation oscillations of the signal wheel, disadvantageously leads to the calculation of a rotational speed of the signal wheel, since pulse signals are emitted by the sensor device even though the signal wheel is not physically rotating, as stated in [010] of the specification.

The Applicant believes that currently pending claims 15 and 29 are patentably distinguished over and from Turner `474 and both independent claims are now in condition for allowance. It must be noted that claims 16-28 are all directly or indirectly dependent from claim 15, so that claims 16-28 incorporate all recitations and limitations of claim 15 by their dependency therefrom. For this reason at the very least, therefore, it is the belief and position of the Applicant that claims 16-28 are thereby fully and patentably distinguished from Turner `474. The Applicant, therefore, respectfully requests that the Examiner reconsider and withdraw all rejections of claims 15-29 under 35 U.S.C. § 102(e) in view of Turner `474 and allow claims 15-29 at this time.

If any further amendment to this application is believed necessary to advance prosecution and place this case in allowable form, the Examiner is courteously solicited to contact the undersigned representative of the Applicant to discuss the same.

In view of the above amendments and remarks, it is respectfully submitted that all of the raised rejections should be withdrawn at this time. If the Examiner disagrees with the Applicant's view concerning the withdrawal of the outstanding rejections or applicability of the Turner `474 reference, the Applicant respectfully requests the Examiner to indicate the specific passage or passages, or the drawing or drawings, which contain the necessary teaching, suggestion and/or disclosure required by case law. As such teaching, suggestion and/or disclosure is not present in the applied references, the raised rejection should be withdrawn at this time. Alternatively, if the Examiner is relying on his/her expertise in this field, the Applicant respectfully requests the Examiner to enter an affidavit substantiating the Examiner's position so that suitable contradictory evidence can be entered in this case by the Applicant.

In view of the foregoing, it is respectfully submitted that the raised rejections should be withdrawn and this application is now placed in a condition for allowance. Action to that end, in the form of an early Notice of Allowance, is courteously solicited by the Applicant at this time.

The Applicant respectfully requests that any outstanding objection(s) or requirement(s), as to the form of this application, be held in abeyance until allowable subject matter is indicated for this case.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,

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